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REMARKS

Claims 1-19 have been amended to more precisely claim the invention according to conventional practice before the United States Patent and Trademark Office. Claims 20-27 have been added. Claims 1-27 are presented for examination. New Claims 20-25 claim matter originally in Claims 3, 10, 14, 15, 16, and 19 respectively. No new matter is being added.

The changes to the claims are shown on a separate set of pages attached hereto entitled VERSION WITH MARKING TO SHOW CHANGES MADE, which follows the signature page of this Preliminary Amendment.

Should there be any questions concerning this application, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number appearing below.

Respectfully submitted,

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Dated: 3/12/01

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A method for growing oxide thin films on a substrate in a reactor, **[characterized in that]** comprising producing the films [are produced] by the Atomic Layer Epitaxy (ALE) process by [using as the] feeding pulses of precursor compounds into the reactor, wherein the precursor compounds [are] comprise:

at least one cyclopentadienyl compound[s] of strontium and/or barium[,];**[together with]**

at least one [or more] volatile titanium compound[s]; and
cycles in succession, wherein one growth cycle **[being made up of the]** comprises:
feeding of a reactive oxygen precursor.

2. (Amended) The method according to Claim 1, **[characterized in that]** wherein the oxide thin film **[to be grown]** is dielectric.

3. (Amended) The method according to Claim 1 **[or 2, characterized in that there are]]**, wherein said method comprises 1-10 **[, preferably 1-2, similar]** growth Ba compound, a Sr compound or a volatile titanium compound;

an inert purge;

[the] feeding **[of]** a reactive oxygen precursor [for oxygen]; and

a second inert purge.

4. (Amended) The method according to **[any of]** Claim[s] 1 **[- 3]**, **[characterized in that]** wherein the **[cycle]** ratio of the **[alkaline earth metal]** at least one cyclopentadienyl compound of strontium and/or barium and the at least one volatile titanium compound is 0.8-1.2.

5. (Amended) The method according to **[any of]** Claim[s] 1 **[- 4, characterized in that]** , wherein the volatile titanium compound is selected from the group consisting of a titanium halide, a titanium alkoxide, titanium nitrate ($\text{Ti}(\text{NO}_3)_4$), an alkylamino complex of titanium, a cyclopentadienyl complex of titanium, a silylamido complex of titanium, titanium dialkyldithiocarbamate, **[or]** and a titanium- β -diketonate.

6. (Amended) The method according to **[any of the preceding claims]** Claim 1, **[characterized in that the film growth]** wherein the substrate is selected from the group consisting of a platinum (Pt), RuO_2 , IrO_2 , SrRuO_3 , LaSrCoO_3 , IrO_2/Ir , RuO_2/Pt , silica (SiO_2), silicon nitride **[or]** and a silicon surface.

7: (Amended) The method according to **[any of the preceding claims]** Claim-1, **[characterized in that]** wherein the reactive oxygen precursor **[used]** is selected from the group consisting of oxygen (O₂), water vapor, hydrogen peroxide **[or]** , an aqueous solution of hydrogen peroxide, **[and/or]** ozone, and a combination thereof.

8. (Amended) The method according to **[any of the preceding claims, characterized in that]** Claim 1, wherein the **[formula of the precursor]** at least one cyclopentadienyl compound of strontium and/or barium is M(Cp)₂ or M(Cp)₂L_n, where M is Sr or Ba,
Cp is a fused or single cyclopentadienyl group of the form **[Cp']**C₅R_mH_{5-m}, where m is an integer 0-5 and
R is a hydrocarbon group, wherein the m hydrocarbon groups **[being mutually]** are either the same or different,
the Cp groups are either the same or different,
L_n is a neutral adduct ligand which binds to the metal by one or several of **[its]** the atoms in said neutral adduct ligand.

9. (Amended) The method according to **[any of]** Claim[s] 1 [- 7, **characterized in that]**, wherein

- the **[precursor for Sr and/or Ba]** at least one cyclopentadienyl compound of strontium and/or barium is **[of the form]** M(Cp)X or M(Cp)XL_n, where
- M is Sr or Ba,
- Cp is a fused or single cyclopentadienyl group **[Cp']**C₅R_mH_{5-m}, where
- m is an integer 0-5 and
- R is a hydrocarbon group, wherein the m R's are **[being mutually]** either the same or different,
- X is a ligand**[, other than Cp,]** having a valence of -1, wherein X is not a cyclopentadienyl group and
- L is a neutral adduct ligand which binds to the metal by one or several of **[its]** the atoms making up said neutral adduct ligand.

10. (Amended) The method according to Claim 8 **[or 9, characterized in that]** , wherein the cyclopentadienyl group is selected from the group consisting of cyclopentadienyl, pentamethylcyclopentadienyl, triisopropylcyclopentadienyl, indenyl, **[or]** and fluorenyl.

11. (Amended) The method according to Claim 8 [or 9, characterized in that],
wherein the two Cp groups are [contained in the same molecule] joined by a bridge.

12. (Amended) The method according to Claim 11, [characterized in that]
wherein the bridge between the two Cp groups is [made up of] a substituted or unsubstituted C₁
- C₆ carbon chain.

13. (Amended) The method according to Claim 12, [characterized in that]
wherein the carbon chain forming the bridge contains a heteroatom[, which is] selected from the
group consisting of silicon, nitrogen, phosphorus, selenium, [or] and sulfur.

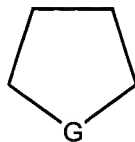
14. (Amended) The method according to Claim 8 [or 9], [characterized in that]
wherein R is a substituted or unsubstituted, cyclic, linear or branched group selected from the
group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, an
amino, a cyano [or] and a silyl group.

15. (Amended) The method according to Claim 8 [or 9, characterized in that],
wherein the neutral adduct ligand L is selected from the group consisting of:

a hydrocarbon,
an oxygen-containing hydrocarbon,
a nitrogen-containing hydrocarbon,
a sulfur-containing hydrocarbon,
a phosphorus-containing hydrocarbon,
an arsenic-containing hydrocarbon,
a selenium-containing hydrocarbon, [and/or]
a tellurium-containing hydrocarbon,
and a combination thereof.

16. (Amended) The method according to Claim 8 [or 9, characterized in that],
wherein L is selected from the group consisting of:

- (a) an amine or polyamine,
- (b) a bipyridine,
- (c) a ligand depicted by the formula



[in which formula] , where G is -O-, -S-, or -NR¹-, where R¹ is hydrogen or a substituted or unsubstituted, cyclic, linear or branched[,] group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, a cyano [or] and a silyl group, and wherein each carbon atom of the ring according the formula [there is] has an R¹-like substituent, wherein the substituents [which] are either [mutually] the same or different,

- (d) ether, [or] and
- (e) thioether.

17. (Amended) The method according to Claim 8 [or 9], wherein L is selected from the group consisting of an ether, a polyether, an amine, a polyamine, bipyridine [or] and tetrahydrofuran.

18. (Amended) The method according to Claim 9, wherein [characterized in that] X is selected from the group consisting of a β -ketonate, [or] a corresponding sulfur or nitrogen compound, an alkyl, a halide, an amide, an alkoxide, a carboxylate [or] and a Schiff base.

19. (Amended) The method according to [any of the preceding claims] Claim 1, [characterized in that] wherein the [growth] producing of the film takes place at 250-300°C[, and the postannealing carried out after the growth takes place at a temperature higher than the deposition temperature, preferably at 500°C].

20. (New) The method according to Claim 3, wherein said method comprises 1-2 growth cycles.

21. (New) The method according to Claim 9, wherein the cyclopentadienyl group is selected from the group consisting of cyclopentadienyl, pentamethylcyclopentadienyl, triisopropylcyclopentadienyl, indenyl, and fluorenyl.

22. (New) The method according to Claim 9, wherein R is a substituted or unsubstituted, cyclic, linear or branched group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, an amino, a cyano and a silyl group.

23. (New) The method according to Claim 9, wherein the neutral adduct ligand L is selected from the group consisting of:

- (i) a hydrocarbon,
 - (ii) an oxygen-containing hydrocarbon,
 - (iii) a nitrogen-containing hydrocarbon,
 - (iv) a sulfur-containing hydrocarbon,
 - (v) a phosphorus-containing hydrocarbon,
 - (vi) an arsenic-containing hydrocarbon,
 - (vii) a selenium-containing hydrocarbon,
 - (viii) a tellurium-containing hydrocarbon,
- and a combination thereof.

24. (New) The method according to Claim 9, wherein L is selected from the group consisting of:

- (a) an amine or polyamine,
- (b) a bipyridine,
- (c) a ligand depicted by the formula



, where G is -O-, -S-, or -NR¹-, where R¹ is hydrogen or a substituted or unsubstituted, cyclic, linear or branched group selected from the group consisting of an alkyl, an alkenyl, an aryl, an alkylaryl, an arylalkyl, an alkoxy, a thio, a cyano and a silyl group, and wherein each carbon atom of the ring according the formula has an R¹-like substituent, wherein the substituents are either the same or different,

- (d) ether, and
- (e) thioether.

25. (New) The method according to Claim 19, further comprising postannealing said film at a temperature higher than a temperature at which the producing of the film takes place.

26. (New) The method according to Claim 24, wherein postannealing said film takes place at 500°C.

27. (New) A method for growing oxide thin films on a substrate in a reactor, comprising producing the films by the Atomic Layer Epitaxy (ALE) process by feeding pulses of precursor compounds into the reactor, wherein the precursor compounds comprise:
at least one cyclopentadienyl compound of strontium and/or barium; and
a reactive oxygen precursor.

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